
II. *An Account of an Experiment made before the* Royal Society *at* Greſham College, *together with a Repetition of the ſame, touching the Production of a Conſiderable Light upon a ſlight Attrition of the Hands on a Glaſs Globe Exhauſted of its Air: With other Remarkable Occurrences. By Mr* Fra. Hauksbee, *F. R. S.*

HAving had the Favour of making ſeveral Experiments, in Relation to the Production of Light from Sundry Bodies, and in Different Manners, before this Honourable Society, which they were pleas'd to Countenance, by their Approbation and Publication of them, as being in ſome reſpect or other, Different from any heretofore made on the ſame ſubject: Which, with the Hopes I had ſtill of Advancing ſome farther Diſcories; And that I thought my Endeavours of this kind would not be altogether unacceptable to the Society, Together with the Nobleneſs of the Subject concurring, prompted me with all willingneſs to proſecute the ſame.

The Experiments already made on this head, As the Attrition of Amber on Woollen, Glaſs on Glaſs, and with ſeveral other Bodies *in vacuo*, which tho afforded but a weak Light, yet the Manner of making them ſeem'd to open a way to farther Improvements, which, during the late Interval of Meeting, I purſu'd with my utmoſt diligence. The Reſult of the many Experiments made on this occaſion are compriz'd in a very few, which ſhall be repeated before this Honourable Society, as Opportunity ſhall give leave.

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One of that ſmall number I had the Honour to make before the Society, who were pleas'd to order a Repetition of the ſame next meeting, which accordingly was done, with ſome little Additions; and in obedience to their Commands to give an Account of it, which, ſo far as occurr'd to Memory, according to my ſlender Capacity for ſuch a task, accept as follows. I took a Glaſs Globe about 9 inches diameter, and having exhauſted the Air from within it, it was taken from the Pump; but firſt a Cock was turn'd, which prevented the Air from re-entering it. Thus ſecur'd, and fixt for to give it Motion by the Great Wheel, deſcrib'd in *Phil. Tranſ.* Numb. 304. which when turn'd gave a ſwift motion to the Globe, on whoſe ſurface was apply'd my open and naked Hands, which in a very little time produc'd a conſiderable Light. And ſtill as I mov'd my Hands from one place to another, that the Humid *Effluvia* (which very readily condenſes on Glaſs) might be diſcharg'd from every part of it; ſo did the Light improve, till Words in Capital Letters were legible by it, as was obſerv'd the laſt time by a Gentleman then preſent. At another time, when I have made the Experiment, the Light produc'd has been ſo great, that a Large Print without much difficulty might be read by it: And at the ſame time, altho in a pretty large Room, the whole became ſencibly Illuminated; the Wall at the fartheſt diſtance (which was at leaſt 10 foot) was viſible. The Light appear'd of a curious Purple colour, and was produc'd by a very ſlight and tender touch of the Hands, the Globe Glaſs at the ſame time being hardly ſenſibly warm. Nor do I find a more immoderate Attrition to advance the Light any thing. Nor is the higheſt degree of Rarifaction of the Air in the Globe, abſolutely neceſſary in the production of this Light; for it ſeem'd to continue very little leſſen'd in its colour or vigour, till (I believe) more than a fourth part of its Air was let in. I have often obſerv'd the ſame, as to the Light produc'd duc'd in the Mercurial Experiments, (but not as to Colour) for in thoſe Experiments it was always pale: And there being ſuch a ſeeming Congruity of Appearances in all the Circumſtances of them, with thoſe made on the Attrition of Glaſs without it, that one might with ſome probability conclude, that the Light produc'd proceeds from a Quality in the Glaſs, upon ſuch a Friction or Motion given it; and not from the Mercury, any other ways than as a proper Body, which falling or rubbing on the Glaſs, produces the Light. And that which would ſeem farther to Corroborate ſuch a Concluſion is, That ſome time ago I took a Mercurial Barometer, and rubb'd the upper or Deſerted part of the Tube between my Fingers, and a Light enſu'd, without the motion of the Quickſilver. Yet for all this the Concluſion is doubtful, and there may be ſuch a Quality as Light in Mercury, as well as in Glaſs or any other body, ſince an Experiment lately made on purpoſe ſeems to contend for it, and is as follows. I took a ſmall quantity of Quickſilver, and put it into a Galleypot, wherein Varniſh often had been uſed, and by that means it had got a pretty thick Lining of it; the Weather was at that time moiſt (which I purpoſely mention, becauſe the humidity in the Air, would ſometimes render the Experiment unſucceſsful even in Glaſs, or at leaſt mightily impair the appearance of it,) which had an influence on the Varniſh, as ſomething to ſoften it. However, the ſucceſs of the Experiment was, That when the Galleypot with its contain'd Mercury came to be *in Vacuo*, upon ſhaking the Pump a Light did appear, and this without the Concurrence of Glaſs, or the favour of a more proper Seaſon to aſſiſt it. Moreover, I am inform'd by ſeveral Perſons of credit, that the Medicine call'd *Mercurius Dulcis*, when broken in the dark, gives notable Flaſhes of Light; but the Mercury in the Medicine being pointed with Salts, each little Globule of it is enveloped with the ſame, that I cannot be aſſur'd the Salts do not con-

contribute to the *Phænomenon*, ſince I have often obſerv'd that Loaf Sugar, when ſtruck or broke in the dark, affords a Light, and I cannot tell but Salts as cloſely united in their parts as the prementioned Sugar, may give a Light upon a violent ſeparation of them, till I have made ſome Tryals, in relation (as near as I can) to a true diſcovery of it: (Which I deſign with the firſt opportunity.) The firſt will be to try whether the Medicine when broken *in Vacuo* will afford any Light, which I think I may expect if it proceeds from the Mercury, ſince if there be any ſuch Quality in that body, it ſeems to be the moſt proper *Medium* to diſcover it in. Secondly, what the Salts will do without Quickſilver, both in the open Air and *in Vacuo*; for there are ſome Bodies that appear light in the dark in the open Air, which altogether loſe that ſhining Quality *in Vacuo*. As for inſtance, I took a piece of Wood, (which I ſuppoſe had lain under ground a conſiderable time,) it was very moiſt, but not rotten, and appear'd very vividly of the Colour of Fire in the dark: Having included it under a Receiver on my Pump, I found as the Air was taken from it, ſo did the Fire-like Appearance of it decay, till at laſt *in Vacuo* it became perfectly void of Light; and as the Air was let in again, ſo by degrees it recover'd its priſtine Appearance. This I repeated ſeveral times with the like ſucceſs. Now begging pardon for this long digreſſion, I proceed to the latter part of the Experiment. After the Attrition of the exhauſted Globe was continu'd for ſome time, the prementioned Cock was return'd, which gave liberty for the Air to inſinuate into the Globe through the joynts of the Screws; the motion of the great Wheel and the application of the Hands continuing all the while: And as the Air fill'd the Globe, ſo the mode of Light continu'd to alter, till the like quantity of Air had re-enter'd as was taken from it; then became as great a difference of Light from what was produc'd when evacuated of

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Air, as when the Experiment was made with Quickſilver-*Vacuo* and in the open Air. Certain Specks of Light were then ſeen upon the Fingers that toucht the Globe, but without any great Luſtre, and it was very remarkable that while my hand continued upon the Glaſs, and the Glaſs in motion, if any perſon approach'd his Fingers towards any part of the Glaſs in the ſame Horizontal Plain with my Hand, within an inch or thereabouts, a Light would appear to ſtick to the Fingers, notwithſtanding they did not touch the Glaſs, as was confirm'd by ſeveral then preſent. And my Neckcloth at the ſame time, at an inch or 2 diſtant from it, appear'd of the colour of Fire, without any communication of Light from the Globe. Thus much for the latter part of the firſt Tryal. The former part of both being alike, ſave only that upon application of white Sheeps Leather in the latter, a very good Light was produc'd, during it was held to the Globe with the Wool ſide next it; but when the ſame piece of Leather was turn'd with its other ſide to the Globe, no Light did enſue, although continued for ſome time; but ſo ſoon as it was chang'd again, the Light would appear as at firſt, and ſo upon ſeveral Repetitions the ſame. As to the latter part of this Tryal, the Air was not let in all at once as before, but at ſeveral times, whereby the Modes of Light produc'd in the different *Mediums*, were the better obſervable, although no very great Alteration happen'd either to its Colour or Vigour, till ſo conſiderable a quantity, as more than a quarter part of the Globes natural content of Air was let in; but ſometimes before half the Air was ſuffer'd to re-enter (as near as I could gueſs) it was not without ſome pleaſure to behold, how the Light began to break in Branches from that ſide the Globe touch'd by the hands, filling the whole body of it with very odd Figures, and theſe Branches of Light, at the entrance of more Air, were become in more ſlender Stems, ſtriking then againſt the oppoſite ſide of the Glaſs, and thence reverberating again

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in a very pleaſing manner; but after more and more Air was let in, ſo the Light and Figures diminiſh'd, till the Appearance became the ſame as related in Tryal the firſt.

III. *A Letter from Mr* Samuel Dale *to Dr* Hans Sloane, *R.S. Secr. giving an Account of what* Manuſcripts *were left by Mr* John Ray, *together with ſome* Anatomical Obſervations *made at* Padua *by the ſaid Mr* Ray.

HErewith you will receive divers *Anatomical Obſervations*, that were made at *Padua*, by our late learned and moſt ingenious Friend the Reverend Mr *John Ray*, upon the diſſection of ſome Humane Bodies, by that great Anatomiſt *Seignior Antonio Marchetti*, and do contain, beſides thoſe things which Mr *Ray* did himſelf remarks, divers Obſervations of the Operators which did not occur in thoſe Bodies, to ſome of which Mr *Ray* hath added Notes. To theſe are ſubjoyned two Diſſections of Mr *Ray*'s, *viz.* of a *Hare*, and the *Mountain Hen*, neither of which can I find publiſhed in his Works, nor hath he taken any notice of theſe Obſervations in his *Book* of *Travels* , altho the Charge was very conſiderable, amounting to 284 *Livres* and 15 *Soldi* of *Venice.*

Beſides theſe, there are in his *Adverſaria* many *Obſervations*, *Inſcriptions*, *Epitaphs*, *Antiquities.* &c. which being collected together, would make a large *Supplement* to his *Obſervations* already publiſhed.

Nor muſt I forget his Travels in our own and the neighbouring Kingdom, of which he hath left divers *Itineraries*: Theſe may not be unuſeful to our *Engliſh* Travellers,